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## Assessment of Heavy Metal Mobilization in Zinc Hydrometallurgy Residues and Their Environmental Impact

By

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This study evaluates the mobilization of Pb, Cd, and As in residues from zinc hydrometallurgy and their potential environmental risks under uncontrolled conditions. The study area is located very close to an urban environment with high population density and has been subjected to strong urban development pressure.





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## What we did?

- ❑ Mineralogical and amorphous phases were characterized by differential X-ray diffraction under simulated environmental scenarios.
- ❑ Chemical analyses of residues and runoff waters included pH, electrical conductivity, salinity, and total and soluble metal concentrations.
- ❑ Ecotoxicological effects were assessed using Microtox®, Ostracods and Phytotest bioassays.





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- Results indicate a high susceptibility to the release of potentially toxic elements depending on environmental conditions. The most critical scenarios involve Cd and Zn mobilization during rainfall events and redox changes in anoxic conditions, As(V) to the more toxic As(III).
- Overall, residues and associated waters exhibit high metal concentrations and significant toxicity, highlighting the need for preventive measures and appropriate management strategies to minimize environmental and human health impacts.

